

附件 1-2：國立屏東科技大學農學院教育目標與核心能力(草案)

經 98.05.11 九十七學年度第二學期擴大院務會議審議通過
經 98.10.01 農學院九十八學年度第一學期第 1 次院務會議修正通過
經 98.10.07 九十八學年度第一學期校課程委員會議審議通過
經 98.10.28 九十八學年度第一學期教務會議審議通過
經 100.10.12 100 學年度第 1 學期第 1 次院課程委員會議通過
經 100.10.19 100 學年度第 1 學期校課程委員會議審議通過
經 100.11.01 100 學年度第 1 學期教務會議審議通過
經 102.3.14 101 學年度第 2 學期第 1 次院課程委員會議通過
經 102.04.25 101 學年度第 2 學期教務會議審議通過
經 106.3.30 105 學年度第 2 學期第 1 次院課程委員會議通過

壹、農學院教育目標：

本院以生物學、化學及生態學為教學基礎，將所屬系所劃分為「植物產業學群」、「動物及水產產業學群」、「食品產業學群」、與「自然資源保育暨利用學群」等四大學群作為教學主軸，以生物為資材，瞭解其特性，利用農業技術進行量產並商品化，並全力發展「科技農業」、「生態產業與永續農業」、「食品安全」及「農業全球化」，推動人才培育、研發與國際交流，以提升人類生活素質及環境永續。各層級之教學目標如下：

一、大學部：

以基礎學科及實務教學為重心，並輔以通識、學程教學之方式，引導學生確認專業發展方向，以學習符合職場中多元社會所需之相關知識與技能。

二、碩士班：

專精、理論與實務並重，配合產業需求之研究方向為發展重點，以培育理論及實務並重之中高階專業及管理人才。

三、博士班：

配合國家發展暨全球科技脈動，培育永續發展之農業高階專業及管理人才。

貳、農學院核心能力：

- 一、具有農業專業知識。
- 二、具邏輯思考、判斷、執行及創新能力。
- 三、具溝通、協調及合作能力。
- 四、具有外語能力及國際視野。

農學院 課程與核心能力之關聯檢核表

核心能力	能力指標與核心素養	對應課程	檢核機制
1.具有農業專業知識	具備農業相關專業知識、技術及經營管理之基本能力	一、院定必選修：實務專題、普通化學、普通化學實驗、普通物理學、普通物理學實驗、生物統計、生物統計實習、永續農業、永續農業國內外專業實習、專技英文寫作、進階專業英文溝通技巧、進階專技英文寫作、生物技術實習、生物資訊學、犬隻照養技術、犬隻傳染病與公共衛生、校外實習、工作犬簡介、犬隻解剖生理學、協助犬訓練技術、協助犬訓練技術實習、偵測犬訓練技術、偵測犬訓練技術實習、視覺障礙重建概論、動物福利與法令 二、本院各系所一般課程及專業課程	本院院課程委員定期依學校與本院教育宗旨與目標，審議本院院定課程的妥適性，審核課程是否具有時代性，並能配合各系專業教育之需求，依社會變遷與就業市場情況，討論課程規劃是否符合就業市場需求及有助於學生就業競爭能力。同時組織院共同必修課程之教學小組，以協助提高教學品質及減少教師授課負擔，設置教學小組之課程為生物技術、生物統計，提供院內學生完整的學習課程體系。
2.具邏輯思考、判斷、執行及創新能力	1.應用各種工具蒐集並分析資料能力 2.尋求解決問題方法及問題解決能力 3.創新思考及創新研發能力	一、院定必選修：實務專題、普通化學實驗、普通物理學實驗、生物統計、生物統計實習、永續農業、永續農業國內外專業實習、生物技術實習、生物資訊學、犬隻敏捷訓練與實習、犬隻服從訓練實習、犬隻行為學、犬舍設計與經營管理、工作犬產業行銷學、校外實習、定向行動概論、犬隻解剖生理學、協助犬訓練技術、協助犬訓練技術實習、偵測犬訓練技術、偵測犬訓練技術實習、視覺障礙重建概論、動物福利與法令 二、本院各系所一般課程及專業課程	
3.具溝通、協調及合作能力	1.良好的溝通技巧及態度 2.整合協調能力 3.敬業合群、樂觀進取 4.良好人際關係與自我學習 5. 團隊組織的管理與領導	一、院定必選修：實務專題、永續農業國內外專業實習、專技英文寫作、進階專技英文寫作、進階專業英文溝通技巧、犬隻敏捷訓練與實習、犬隻服從訓練實習、校外實習、犬舍設計與經營管理、工作犬產業行銷學、犬隻解剖生理學、協助犬訓練技術、協助犬訓練技術實習、偵測犬訓練技術、偵測犬訓練技術實習、視覺障礙重建概論、動物福利與法令 二、本院各系所一般課程及專業課程	
4.具有外語能力及國際視野	1.具備國際觀之素養 2.瞭解國際社會與全球發展 3.基礎外語聽說讀寫能力	一、院定必選修：永續農業、永續農業國內外專業實習、專技英文寫作、進階專技英文寫作、進階專業英文溝通技巧、工作犬概論、工作犬簡介、定向行動概論 二、本院各系所一般課程及專業課程	

農學院課程與核心能力關聯表

【院定必修】					
核心能力項目 科目名稱	專業具有農業知識	力及創新能	斷、執行考、判具邏輯思	作能力協調及合具溝通、	際視野能力及國具有外語
實務專題	●		●	●	
普通化學	●				
普通化學實驗	●		●		
普通物理學	●				
普通物理學實驗	●		●		
生物統計	●		●		
生物統計實習	●		●		

農學院課程與核心能力關聯表

【院定選修】					
核心能力項目 科目名稱	專業具有農業知識	力及創新能	斷、執行考、判具邏輯思	作能力協調及合具溝通、	際視野能力及國具有外語
永續農業	●		●		●
永續農業國內外專業實習	●		●	●	●
專技英文寫作	●			●	●
進階專技英文寫作	●			●	●
進階專業英文溝通技巧	●			●	●
生物技術實習	●		●		
工作犬概論					●
犬隻敏捷訓練與實習			●	●	
犬隻服從訓練實習			●	●	
犬隻服從訓練			●	●	
犬隻行為學			●		
犬隻照養技術	●				
犬舍設計與經營管理			●	●	

犬隻傳染病與公共衛生	•			
工作犬產業行銷學	•	•	•	
工作犬簡介	•			•
校外實習	•	•	•	
定向行動概論		•		•
犬隻解剖生理學	•	•	•	
協助犬訓練技術	•	•	•	
協助犬訓練技術實習	•	•	•	
偵測犬訓練技術	•	•	•	
偵測犬訓練技術實習	•	•	•	
視覺障礙重建概論	•	•	•	
動物福利與法令	•	•	•	

農學院課程中英文摘要

一、農學院

實務專題

本課程在訓練學生運用適當之研究方法完成專題計畫。學生將以個人與指導老師進行討論方式進行資料蒐集、分析、論文撰寫、與專題發表。

Special Projects

This course aims to develop students ability in completing research along with discuss with instructor to finish specific experiments. Students will have to finish a study with a special topic they choose. A final oral presentation will be held later this year.

普通化學(1)

本課程開設之目標為訓練學生使熟悉各種化學之基本操作，並驗證各有關之化學原理。其內容為：1.安全及環保教育講習。2. 混何物分離。3.密度測量。4. 質量守恆定律。5. 化學式的測定。6. 固體中水分測量。7. 定組成定律。8. 氧化還原反應。9. 溶液的配製。10. 氧化還原滴定。11.化學平衡。12.一酸及鹼之 pH 值測定。13.酸鹼滴定。14. 滴定曲線繪製。

General Chemistry (1)

This course provides students a profound understanding of subject-matter from laboratory work and familiarity with basic laboratory technique. The outlines are as below: 1. Basic laboratory rules and safety. 2. Separation of mixtures. 3. Determination of density. 4. Law of conservation of mass. 5. Determination of empirical formula. 6. Determination of water content in solid. 7. Law of definite composition. 8. Oxidation-Reduction reactions. 9. Solution preparation. 10. Oxidation-Reduction titration. 11. Chemical equilibria. 12. Determination of pH. 13. Acid-Base titration. 14. Titration curve.

普通化學實驗(1)

本課程開設之目標為訓練學生使熟悉各種化學之基本操作，並驗證各有關之化學原理。其內容為：1.安全及環保教育講習。2. 混何物分離。3.密度測量。4. 質量守恆定律。5. 化學式的測定。6. 固體中水分測量。7. 定組成定律。8. 氧化還原反應。9. 溶液的配製。10. 氧化還原滴定。11.化學平衡。12.一酸及鹼之 pH 值測定。13.酸鹼滴定。14. 滴定曲線繪製。

General Chemistry Lab. (1)

This course provides students a profound understanding of subject-matter from laboratory work and familiarity with basic laboratory technique. The

outlines are as below: 1. Basic laboratory rules and safety. 2. Separation of mixtures. 3. Determination of density. 4. Law of conservation of mass. 5. Determination of empirical formula. 6. Determination of water content in solid. 7. Law of definite composition. 8. Oxidation-Reduction reactions. 9. Solution preparation. 10. Oxidation-Reduction titration. 11. Chemical equilibria. 12. Determination of pH. 13. Acid-Base titration. 14. Titration curve.

普通物理學 (1)

本課程旨在介紹物理的基本概念及原理，藉由例題實作演練，增進同學對物理觀念及原理之了解，並提昇同學解決問題及計算之能力，以奠定修習專業科目的基礎。課程內容包括： 1.物理量及單位 2.直線運動 3.平面運動 4.動力學 5.功與能 6.質點系之力學。

General Physics (1)

(1)Introduction, (2)Motion along a Straight Line, (3)Motion in a Plane, (4)The Laws of Motion, (5)Work and Energy, (6)Linear Momentum.

普通物理學實驗 (1)

本課程之目的為使學生藉由物理實驗過程來印證古典力學、流體力學、熱力學之理論及定律，同時培養學生實作能力。課程內容包括：(1)基本量測，(2)PASCO 軟體介紹，(3)自由落體，(4)牛頓第二運動定律，(5)單擺，(6)摩擦係數，(7)碰撞，(8)表面張力，(9)固體比熱，(10)液體比熱，(11)線膨脹，(12)熱功當量，(13)牛頓冷卻定律。

General Physics Lab. (1)

The purpose of this course is to enable students to demonstrate the theory and laws of classical mechanics, fluid mechanics and thermodynamics by means of physical experiments and to develop students' practical ability. (3) Free fall, (4) Newton's second law of motion, (5) Simple pendulum, (6) Coefficient of friction, (7) Collision, (2) Pasco software introduction, (8) surface tension, (9) solid specific heat, (10) liquid specific heat, (11) linear expansion, (12) thermal equivalent, (13) Newton's law of cooling.

生物統計

本課程內容包括數據資料之特性及分析方式，並介紹敘述統計，各種分布(包括常態、二項式、多項式、卜瓦松、t、卡方、F等分布)、信賴區間應用、假設檢定與變方分析等。

Biometry

The course introduces data characteristics and analysis methods. Other main topics include the descriptive statistics, different distributions such as normal, binomial, polynomial, Poisson, t, chi-square, and F-distribution, confidence interval applications, hypothesis testing and analysis of variance.

生物統計實習

本實習依上課進度進行對數據整理，敘述統計及各項分布(常態，二項式，多項式，卜瓦松，t，X，F分布)及其信賴區間等，以生物數據實例進行練習。

Practice of Biometry

This course is a practice lesson that follows the biostatistics course about data characteristics and analysis methods. Major focus will be on exercises of biological data for descriptive statistics, probability distributions (Normal, binomial, Poisson, t, chi-square, and F), confidence interval applications, hypothesis testing and analysis of variance.

院定選修

永續農學

最近的 20 年中，在創意和科技方面的顯著進展，已形成推動永續農業的良好機會。目前全球農業部門正面臨在有限的自然資源和氣候變遷的壓力下，仍必須提供足夠的食物、纖維、飼料、以及生質能源，以滿足全球不斷增加人口需求的挑戰；此外社會大眾也逐漸期待在農業生產過程中，能加強注重對環境生態、勞動人力、動物福利的維護。本課程將評論可以從環境生態和社會經濟等層面提升農業永續經營的農業栽培措施與技術和管理系統，以及採用不同措施、技術和管理系統的優劣與得失。此外，本課程也將探討目前在提升農業永續經營上仍欠缺的知識，提供學生未來學習的方向。

In the last 20 years, there has been a remarkable emergence of innovations and technological advances that are generating promising changes and opportunities for sustainable agriculture, yet at the same time the agricultural sector worldwide faces numerous daunting challenges. Not only is the agricultural sector expected to produce adequate food, fiber, and feed, and contribute to biofuels to meet the needs of a rising global population, it is expected to do so under increasingly scarce

natural resources and climate change. Growing awareness of the unintended impacts associated with some agricultural production practices has led to heightened societal expectations for improved environmental, community, labor, and animal welfare standards in agriculture. This course reviews the state of knowledge on farming practices, technologies, and management systems that have the potential to improve the environmental, social, and economic sustainability of agriculture, and discusses the tradeoffs and risks that might occur if more farms were to adopt those practices, technologies, and systems. This course also identifies knowledge gaps for future actions to improve agricultural sustainability.

專技英文寫作

本寫作課程專為非英文系學生設置，培養學生正確寫作觀念，能更有效率學習及自我學習英文習慣；拓過本欲笨課程指導，能藉由本課程內安排實地練習，增加寫作能力與學習自信心，進而讓學生習得全盤專技寫作能力，及修正自己論文寫作上缺失。

The course of Academic Writing is specially designed for non-English major students of NPUST. Even the most able student in a traditional classroom can feel overwhelming and unprepared in academic writing. This course aims to prepare students for the challenges of academic work by training them in effective study habits.

This course aims to guide students through the process of prewriting and writing essays, and prepare them to encounter academic writing with skills and confidence. At the end of this course, students will be able to -acquire overall knowledge of professional paper writing
-develop a capacity of publishing their professional papers

進階專技英文寫作

本rup4ru，寫作課程專為非英文系學生設置，培養學生正確寫作觀念，及自我學習英文習慣；能藉由本課程實地練習，增加寫作能力與學習自信心，進而讓學生習得全盤專技寫作

能力，及修正自己論文寫作上缺失。

The course of Advanced Academic Writing is specially designed for non-English major students of NTPU. Even the most able student in a traditional classroom can feel overwhelming and unprepared in academic writing. This course aims to prepare students for the challenges of academic work by training them in effective study habits.

This course aims to guide students through the process of prewriting and writing essays, and prepare them to encounter academic writing with skills and confidence. At the end of this course, students will be able to...

- acquire overall knowledge of professional paper writing
- develop a capacity of publishing their professional papers

工作犬訓練學程

二、選修科目 Selective Courses

工作犬概論

2 選

陳晴惠

工作犬概論內容，廣泛介紹世界現有各項工作犬種類以及其相關知識，包括牧羊犬、雪橇犬、搜救犬、偵測犬、導盲犬、導聾犬、輔助犬及治療犬/陪伴犬等，種類眾多。雖然各工作犬項目功能及性質相異，卻均為運用犬隻優異的本能，以及其樂於服務協助人類的特性，加以培養訓練及發展出各項專長，並用以增進人類社會生活之品質。

Introduction of Working Dogs

2 E

Chen Ching

Hui

The working dog summary will introduce different types of working dogs currently used over the world and relevant knowledge. This includes herding dogs, sled dogs, search and rescue dogs, detector dogs, guide dogs for the blind, hearing dogs for the deaf, service dogs for the disabled, therapy dogs and companion dogs for the sick/elderly etc. Although each work has its own unique characteristic and function, they were all based on canine's inherent abilities and willingness to provide service to men. This was utilized and developed into different fields to enhance the life quality of human society.

犬隻照養技術

2 選

夏良宙

犬隻照養包括從幼犬到成犬以致老犬的照顧方式，各時期之營養需求、疾病預防、身體清潔、毛的整理梳洗、指甲修剪和耳朵清理等照養的方法；另外也介紹如何安排一天的生活方式，有些狗住公寓，有些狗住鄉村，有些是住工作犬舍，他們活動的空間不同，就有不同帶出門散步的需求。犬舍管理這個項目針對飼養多隻的工作犬舍進行討論，包括每日犬舍打掃、新進犬隻的待遇、犬舍消毒和犬隻福利等，以及飼料儲存，廢棄物處理等項目。

Technology of Dog Care

2 E

Liang Chou Hsia

Dog care includes dietary requirements, disease prevention, grooming (such as coat brushing, nail clipping and ear cleaning), and overall healthcare throughout dogs life. There are also some basic knowledge regarding how to meet dogs' different needs appropriately according to their variable life style and environments (eg. apartment, countryside or kennels). Kennel management will cover cleaning, disinfection, maintenance of the environment, adjustment of incoming dogs, food storage, process of disposals and overall inhabitant comfort and health.

犬隻解剖生理學

2 選

劉炳燦、

劉世賢、劉世華

本課程以犬隻解剖學及生理系統介紹犬隻身體各部位構造與功能，依次分別為骨骼、肌肉、神經、血管循環、呼吸、消化、吸收、代謝、排泄、內分泌及生殖等系統。

Anatomy of the dog 2 E Bing-Tsan Liu Shyh-Shyan Liu, Shyh-Hwa Liu

This course introduces the dog anatomy and physiological systems of the body structure and function of each part in turn were bones, muscles, nerves, blood vessels circulation, respiration, digestion, absorption, metabolism, excretion, endocrine and reproductive systems.

犬隻行為學

2 選

夏良宙

本課程之主要教學目的為：1.提供養狗者對狗行為之基本認識，

2.做為訓練狗之基礎學門。本課程之內容包括下列各項：演化和家畜化、行為生物學、行為發育學、遺傳與行為學、攝取行為、社會行為、溝通行為、性行為、親子行為、學習行為、排糞尿行為、害怕行為、刻板行為、破壞行為、老狗行為、品種間行為之差異、犬隻和人之關係。

Dog ethology

2 E Liang Chou Hsia

The purpose of this class is to let students 1. understand the basic behavior of dog, 2. use this knowledge as a tool to train dogs. The content of the course include: evolution and domestication, behavior biology, behavior development, genetics and behavior, ingestive behavior, social behavior, communication behavior, sexual behavior, maternal behavior, learning behavior, eliminative behavior, fear, stereotypic behavior, destructive behavior, elderly behavior, behavior difference among breeds, relationship between dog and human beings.

犬隻服從訓練

2 選

周甫炫

服從訓練為維持人犬間良好關係理想方式之一，更是行為矯正最基本的方法，主要從狗對人及狗對其他動物的社會化入門，相處時建立適當位階、增加彼此溝通之默契，針對坐下、趴下、過來、坐下等待、趴下等待、定點休息和跟著走等項目進行訓練，讓狗能依主人口令做出正確的動作。

Obedience Training

2 E Ju Bo Hyoun

Obedience training is an ideal way to build up good relationship between men and dogs. By doing this properly, it's not only helping to set up correct hierarchy, but also providing important foundation of any training programs. This training covers basic commands such as "sit", "down", "come", "sit and wait", "down and wait" and "heel", and requires dogs to fully understand and follow these commands.

犬隻服從訓練實習

1 選

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Obedience Training and Practice 1 E Ju Bo Hyoun

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協助犬訓練技術 2 選 陳晴惠

協助犬訓練基本學習及訓練知識實作，包括犬類行為觀察、制約訓練、導聾犬訓練、導盲犬訓練、肢輔犬訓練實作及犬舍參觀、身心障礙者活動設計。

Technology of Assistance 2 E Chen Ching Hui Dog Training

Hands-on lab for Students to improve their observation skills and training skills. They will be require to train various tasks for hearing dog, guide dog and service dog work. Lab activities kennel tours and simulation exercises for students to understand How the disabled perceive the world, what the need and what they might be helped with the assistance dogs.

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Technology of Assistance 1 E Chen Ching Hui

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偵測犬訓練技術 2 選 周甫炫

本課程介紹偵測犬目前的應用以及針對各項偵測犬從選擇測驗、訓練理論到訓練實務分別講解，並讓學生有實際操作訓練的機會。

Technology of Detector Dog 2 E Ju Bo Hyoun

Training

The class will introduce the application of detector dog in the moment and individual part of detector dog from selection test, principle of training and give chance for students to practice.

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視覺障礙重建概論分為定向與行動、點字、職務再設計三大主軸，藉由各種輔具的介紹（人導法、手杖、點字）學習如何教導視障者在行動的過程中，利用身邊的線索如：陽光、風向、氣味等搜尋並建構地圖，瞭解方向與方位、空間概念等，使其能獨立的行動，並學習尋求他人之協助，以期安全、迅速的抵達目的地，增進視障者學習的機會，擴展視障者的生活經驗。

Introduction of visual barrier reconstruction 2 E

Introduction of vocational rehabilitation is divided into orientation and mobility、Braille and job redesigning three major part. By introduction of assistance aids (Human-guides Techniques, white cane, Braille) learning how to teach blind people use the information such as sunshine, wind direction and smell, etc., to search and build map in his mind on the process of moving, to understand direction, position and space, etc.. The purpose is that blind people can move by himself, learn how to ask help on the process of moving, go to the destination safety and fast. Blind people will have more chance to study, and expand the experience of life.

犬敏捷運動可增加人狗之間的情感，提高彼此的默契，提升犬隻對人類社會的融入，使雙方擁有更多相處互動的方式與樂趣。相處時建立適當位階、增加彼此溝通之默契，針對坐下、趴下、過來、坐下等待、趴下等待、定點休息和跟著走等項目進行訓練，讓狗能依主人口令做出正確的動作；課程中會從最基本的繫牽繩訓練到高階的無牽繩伴行進行說明，並會針對各種訓練用的工具分別介紹。

Dog Agility Training and Practice 2 E Chen Ching Hui

Dog agility training can increase the emotional bonding between pet owners and their pets, improve mutual understanding, facilitate the integration of dogs into human's society, so that both sides can have better interaction with each other and enjoy the fun of companionship. It's important to teach the dogs to know their position in the hierarchy, which can increase the effectiveness of communication and facilitate the teaching and learning of the basic commands, such as sit down, get on the ground, sit down and wait, get down to wait, fixed-point rest and follow. The class will start from basic on-leash to more advanced free- of- leash training, and basic training equipment will be introduced in the course as well.

犬舍設計與經營管理

2 選

陳晴惠

目前狗旅館是很熱門的行業，也紛紛設計建造新穎豪華的犬舍，然而在設計建造時需要注意的事項是非常重要的，舉凡位置及坐落方向的選擇、電力及供水的來源、汙水的處理、陽光照射或特殊天候的預防、接待室、員工休息室、準備室、淋浴間和儲藏室等都需要在設計時列入考慮。經營管理時清掃、散放、餵食、洗澡和修爪剪毛等例行工作，或是每月要投予的心絲蟲和跳蚤預防藥，還有每年要進行的預防注射或內寄生蟲驅除等健康維護都是應妥善安排的事項。

Kennel design and management

2 E

Chen Ching Hui

Recently dog hotel has developed into a very popular industry, and many luxurious kennel have been designed and constructed. However when designing a kennel, many issues have to be taken into consideration, such as location, the source of electricity and water supply, sewage treatment, sun exposure or precautions for special weather conditions, reception rooms, staff lounges, preparation rooms, showers and storage rooms. All of these items need to be taken into account when kennels are designed. Furthermore, dog management issues and routine works such as , cleaning, dispersing, feeding, bathing and claw clipping, and the administration of monthly preventive heartworm and flea medication, and annual injections for internal parasites are also important and to should be properly arranged.

犬隻傳染病與公共衛生

2 選

待聘

犬隻傳染病病源計有病毒、細菌、黴菌、原蟲、內寄生蟲和外寄

生蟲等。畜主或伴侶犬經營者應熟習這些傳染病，在公共衛生的考慮下，做好健康維護和傳染病預防，同時也兼顧人類的健康，不受愛犬少數共通傳染病病源的影響。

Dogs Infectious Diseases and Public Health 2 E

Dogs Infectious diseases include viruses, bacteria, molds, protozoa, parasites and parasites. Livestock or companion dog operators should be familiar with these infectious diseases, in public health considerations, good health maintenance and infectious disease prevention, but also take into account the health of mankind, not a small number of dogs affected by the impact of infectious diseases.

工作犬簡介 2 選 待聘

工作犬概論內容，廣泛介紹世界現有各項工作犬種類及其相關知識，包括牧羊犬、雪橇犬、搜救犬、偵測犬、導盲犬、導聾犬、輔助犬及治療犬/陪伴犬等，種類眾多。雖然各工作犬項目功能及性質相異，卻均為運用犬隻優異的本能，以及其樂於服務協助人類的特性，加以培養訓練及發展出各項專長，並用以增進人類社會生活之品質。

Working Dogs 2 E

The purpose of this course is to study the microbiological science and to give students the basic knowledge further study of phytopathogenic microbiology. Course contents include the original of microbiology, chemical principles, microscopy and staining, morphology、structure and function of prokaryotic and eukaryotic cell, microbial growth and metabolism, microbial genetics and biotechnology, and the control of microorganisms.

工作犬產業行銷學 2 選 待聘

工作犬項目繁多，如果希望在台灣廣泛推動，必須運用行銷學的方策，針對行銷的意義、市場理念的推進、行銷的應用和管理等內容，讓學生對行銷工作犬有基本的認識。

Working Dog Industry Marketing 2 E

If we want working dog to be widely promoted in Taiwan, we must use the marketing strategy, for the marketing significance, the promotion of the market concept, the application of marketing and management and so on, so that students have a basic understanding of working dog industry marketing .

校外實習 3 選 待聘

本課程之目的在使學生在校外實務實習中，將所學理論與實際配合，在操作中學習，了解當前業界現況與職能需求。

Field practice 3 E

The purpose of this course is to enable students to study and understand the current situation and functional requirements of the industry in the practical practice field.

定向行動概論 2 選 待聘

定向行動概論分為定向與行動兩大主軸，藉由各種輔具的介紹（人導法、手杖、導盲犬、放大倍率望遠鏡）與感官功能的分析，學習如何教導視障者在行動的過程中，利用身邊的線索如：陽光、風向、氣味等搜尋並建構地圖，瞭解方向與方位、空間概念等，使其能獨立的行動，並學習尋求他人之協助，以期安全、迅速的抵達目的地，增進視障者學習的機會，擴展視障者的生活經驗。

Introduction of orientation
and mobility 2 E

Introduction of orientation and mobility is divided into two major parts: 1. orientation 2. mobility. By introducing assistance aids (Human-guides Techniques, white cane, guide dog, high magnifying telescope) and analyzing the other senses, the students learn how to teach blind people use the information such as sunshine, wind direction and smell, etc., to search and build mental map in the process of moving. Also they need to understand direction, position and space, etc.. The purpose is that blind people will be able to move by himself, learn how to ask for help if necessary, get to the destination safely and fast. Then they will have more chance to study, and expand their life experiences.

動物福利與法令 選 待聘

主要針對工作犬的居住空間、籠舍大小、每日飲食、運動及訓練方式進行規範，並說明動物福利的相關法令。

Animal Welfare and Law

E

Mainly to regulate living space, cottage size, daily diet, exercise and training methodse for working dogs and explain related laws and regulations of animal welfare.